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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/057,502	04/09/1998	EIICHI SANO	009683-329	6476
21839	7590	07/07/2006	EXAMINER	
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			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/057,502

Applicant(s)

SANO ET AL.

Examiner

LAM S. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8, 11, 14-16, 26, 28, 29, 34, 35, 37 and 39-41 is/are pending in the application.
- 4a) Of the above claim(s) 6, 7, 11, 14-16, 28, 29, 35, 37, 40 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 26, 34 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 1998 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saruta (US 5980015) in view of Kimura et al. (US 6270199).

Saruta discloses an ink jet printer ejecting a plurality of kinds of ink droplets of different sizes from a single nozzle depending upon data to be printed, thereby forming an image on a prescribed recording medium using dots of sizes corresponding to the sizes of the ink droplets (*Abstract and FIG. 5*), comprising:

an ink jet head for ejecting a larger droplet and a smaller droplet from a single nozzle based on data to be printed, thereby printing dots of sizes corresponding to the sizes of the ink droplets on a prescribed recording medium (*FIG. 5*),

a controller for controlling to maintain constant the speed of ejection of the smaller ink droplet and changing the timing of ejection of the smaller ink droplet, by ejecting the smoothing droplet at the same speed as that of the image forming droplet (*FIG. 6: The timing ejection of the second drive signal is different in FIG. 6a and FIG. 6b. The speed of ejection of the smaller ink droplet is constant as shown in FIG. 7a when the time period is greater than*

Df12. The ejection speed of the smaller ink drop and that of the larger ink drop are the same due to the voltage of the drive waveforms is greater than 15V).

wherein the ink ejection is performed using a piezoelectric element (*FIG. 1, element 6*) and a drive waveform applied to the piezoelectric element in ejecting image forming droplets is different from a drive waveform applied to the piezoelectric element in ejecting smoothing droplets (*FIG. 6*).

Surata, however, does not teach a smoother for performing a smoothing process using the larger and smaller ink droplets to form a forming image dot and a smoothing dot, respectively, wherein the distance between a center of the smaller size smoothing dot and a center of an image forming dot is smaller than the pitch of the image forming dot.

Kimura et al. discloses an ink jet printing apparatus comprising a smoother for performing a smoothing process using a small ink drop to form a smoothing dot (*FIG. 19A-C: The smaller dots are the smoothing dots*) and a large ink drop to form a forming image dot, wherein the distance between a center of the smaller size smoothing dot and a center of the image forming dot is smaller than the pitch of the image forming dot (*FIG. 19A-C: The distance from the center of a smaller dot to the center of an adjacent biggest dot is smaller than the pitch which is the distance between the centers of the adjacent biggest dots*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the printing apparatus disclosed by Saruta et al. to include a smoother for performing a smoothing process using small and large ink drops in a manner as disclosed by Kimura et al. The motivation for doing so would have been to obtain images with curves and oblique lines can be realized with smooth lines so the quality of images such as

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characters and graphic patterns can be improved as taught by Kimura et al. (*column 6, lines 57-60*).

2. Claims 8, 26, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saruta (US 5980015) in view of Kimura et al. (US 6270199), as applied to claim 39, and further in view of Koitabashi et al. (US 6325492).

Saruta, as modified, discloses the claimed invention as discussed above except determination means for determining a direction of the printing position of said smaller dot/smoothing dots, said controller controlling the printing position of said smaller dot/smoothing dots according to the determination, wherein said smaller dot and said image forming dot are ejected during a single scan, and wherein in said timing control, the timing of applying signal voltage to print said smaller dot is controlled.

Koitabashi et al. discloses an ink jet apparatus employing an ink jet head that is capable to operate in a smoothing mode, in which a direction of printing positions of smoothing dots (*FIG. 43, the small dots*) is determined to control the printing position of the smoothing dots (*column 26, lines 6-17*), wherein the smaller dots and image forming dots (*FIG. 3: The large dots*) are ejected during a single scan (*FIG. 47-56 and column 27, lines 10-17*), and wherein the timing of applying signal voltage to print the smoothing dots is controlled (*column 27, lines 64-67*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the controller disclosed by Saruta, as modified, to include means for determining a direction of the printing position of the smoothing dots as disclosed by Koitabashi et al. The motivation for doing so would have been to be able to locate the smoothing

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dots (the interpolating dots) in accordance to the presence and absence of the forming dots (the original dots) as taught by Koitabashi et al. (*column 26, lines 7-14*).

Response to Arguments

Applicant's arguments with respect to claim 39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LN
06/27/2006

 6/30/06
MANISH S. SHAH
PRIMARY EXAMINER